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ABSTRACT

This study identified the cognitive style (as defined by the construct of field independence/dependence) of prospective teachers at Eastern Kentucky University and identified instructional strategies reflective of the field independent/dependent dimension of cognitive style. In the 1984 Fall Semester the Group Embedded Figures Test was administered to 313 teacher education majors to assess their ability to identify simple figures located in complex figures. The ability to locate the figures indicated field independence while the inability to locate the figures indicated field dependence. The results of this study indicated 65 percent of the females and 49 percent of the males were extremely field independent or dependent. These results point to the importance of enhancing teachers' awareness of their less preferred cognitive style and the respective instructional strategies reflective of that style. Instructional strategies reflective of the field independent/dependent dimensions of cognitive style are addressed. (PN)

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FIELD INDEPENDENCE AND FIELD DEPENDENCE
OF PROSPECTIVE TEACHERS AT EASTERN KENTUCKY UNIVERSITY

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Abstract

The purpose of this study was to identify the cognitive style (as defined by the construct of field independence/dependence) of prospective teachers at Eastern Kentucky University (EKU) and to identify instructional strategies reflective of the field independent/dependent dimension of cognitive style. Cognitive style is defined as a person's preferred mode of processing information and the consistency with which perceptions are categorized and organized. Numerous dimensions of cognitive style have been posited. Among these is the field independence/dependence dimension. Field independence/dependence is reflected in how people analyze and organize information and their ability to decompose a complex perceptual field into its component parts. The Group Embedded Figures Test (GEFT) is a paper-pencil test designed to measure the degree to which one is field independent or dependent. In the 1984 Fall Semester the GEFT was administered to 313 teacher education majors to assess their ability to identify simple figures located in complex figures. The ability to locate the figures indicated field independence while the inability to locate the figures indicated field dependence. Research regarding behavioral correlates of teachers and students with field independence/dependence have been conducted. This study's results indicate that 65% of the females and 49% of the males were identified to be extremely field independent or field dependent. In accordance with these results, instructional strategies reflective of each of these respective dimensions are addressed.

Field Independence and Field Dependence of

Prospective Teachers at Eastern Kentucky University

Cognitive style refers to one's preferred mode of perceiving, remembering, and thinking (Kogan, 1971) and the consistency with which perceptions are categorized and organized (Furr, Lee, & Davis, 1984). Numerous dimensions of cognitive style have been posited by educators and psychologists. Among these is the field independence/dependence dimension.

Differences among individuals on the continuum of field independence/dependence represent the degree to which one independently functions in differentiating the environment. A relatively high degree of differentiation indicates greater field independence; a relatively low degree of differentiation indicates greater field dependence (Minton & Schneider, 1985). Field independence/dependence is also reflected in how people analyze and organize information and their ability to decompose a complex perceptual field into its component parts. Persons who are field independent tend to analyze the individual elements making up a task or situation (i.e., they focus upon individual items and are easily able to separate the items from the background). Field dependent persons demonstrate less ability to separate discrete parts from the background (i.e., they focus on the whole and tend to overlook component parts). It follows from the field independent/dependent construct that everyone is located at some point on the continuum from high field independence

to high field dependence. Although the construct is described as a continuum along which people fall, the research describes two distinct classes of people: field independent and field dependent (Furr, Lee, & Davis, 1984).

The concept of cognitive style had its origins in the psychological laboratory of Witkin (1962). He utilized the Rod and Frame Test (RFT) to differentiate field independence and field dependence. The field independent person adjusted the rod to a perfect upright position. The field dependent person, strongly influenced by the frame or field, did not rotate the rod to a vertical position. A similar test, the Body Adjustment Test (BAT), was developed by Witkin, Moore, Goodenough, and Cox (1977). In this test a small room contained a chair, and the chair and room could be tilted independently. The task was to adjust the chair to an upright position while ignoring the room or field. Field independent subjects were able to upright the chair to a vertical position while field dependent subjects, unable to separate the part from the field, tilted the chair to align it with the tilted room.

The early work in cognitive style also involved the Hidden Figures Test (HFT). The HFT is a pen and paper test in which the person was given a series of complex figures and asked to locate simple figures embedded within them. As in the RFT and the BAT, the person was asked to separate perceptually the individual parts from the complex whole. As the research on cognitive style

progressed, other paper and pencil tests were developed, the most well-known of these is the Embedded Figures Test (EFT) for individuals and the Group Embedded Figures Test (GEFT) for groups. Each of these asked the subject to identify simple figures located in complex figures. Ability to locate figures indicated field independence while the inability to locate the figures indicated field dependence. Studies have examined the construct of field independence/dependence in relation to intellectual tasks, social tasks, social skills, reinforcement procedures, personality characteristics, learning preferences, teaching choices, and problem-solving skills (Davis, 1983; Thomas, 1977; Witkin, Moore, Goodenough, & Cox, 1977).

The impact of matching and mismatching students and teachers on field independence/dependence have also been investigated. DiStefano (1969) concluded that students and teachers who were matched viewed one another more positively while those who were mismatched viewed one another more negatively. Dembo (1981) concluded that students' achievement may be increased by matching students and teachers on field independence/dependence. However, regarding grades assigned by teachers to students, James (1973) evidenced that the teacher highest in field independence assigned higher grades to his field independent students while the most field dependent teacher assigned the highest grades to field dependent students.

Given the implications of matching and mismatching teachers and students on cognitive style, conclusions by Ramirez and Castenada

(1974) are noteworthy. Ramirez and Castenada (1974) concluded that the identification of field independence/dependence for teachers and the instructional strategies reflective of field independence/dependence will facilitate the training of teachers to teach bicognitively. The training of teachers to teach bicognitively includes the development of one's interactional style, the curriculum, and classroom environment to reflect characteristics designed to enhance the learning for both field independent and field dependent students.

Matching the teaching style of the teacher to the learning style of the student is one reason for assessing the field independence/dependence of prospective teachers. However, a more important reason is to make teachers aware of their less preferred style and to assist in the development and practice of unfamiliar instructional strategies reflective of that style (Ramirez & Castenada, 1974).

In summary, the purpose of this study was to identify the cognitive style (as defined by the construct of field independence/dependence) of prospective teachers at ECU and to identify instructional strategies reflective of the field independent/dependent dimension of cognitive style to enhance the learning for field independent as well as for the field dependent students.

Method

During the first week of the 1984 fall semester, the GEFT was administered to all prospective teacher education majors ($n = 313$) enrolled in Professional Laboratory, an experiential course for education majors. Both male ($n = 87$) and female ($n = 226$) teacher education majors were administered the GEFT to assess the degree to which they were field independent or field dependent. The GEFT was administered on two consecutive evenings to approximately 150 students per evening. The GEFT was the first of a series of tests administered and required approximately 25 minutes of the scheduled two hour testing session. Students were informed of the required evening testing session prior to enrollment in the course.

Results

The data obtained were analyzed on an Apple II-C microcomputer using the statistical package Keystat (Strang & Innes, 1982). Table 1 depicts the descriptive statistics based upon quartiles for male students who were field independent and field dependent. In addition, quartiles for female students who were field independent/dependent are shown. As can be seen from the table, a higher percentage of both males and females are field dependent.

Discussion

The purpose of this study was two-fold. The first purpose was to identify the cognitive style (as defined by the construct of

Table 1

Field independence/dependence for the upper and lower quartiles
for males and females on the GEFT

Males	Range of Scores*	Quartile	N	%
Field independent	16-18	Q ₄	18	21%
Field dependent	0-9	Q ₁	24	28%

Total N = 87

Females	Range of Scores*	Quartile	N	%
Field independent	15-18	Q ₄	42	19%
Field dependent	0-8	Q ₁	103	46%

Total N = 226

*The range of scores are based on national norms taken from the
GEFT Manual (Witkin, Oltman, Raskin, & Karp, 1971).

field independence/dependence) of prospective teachers at EKU. The second purpose was to identify instructional strategies reflective of the field independent/dependent dimension of cognitive style.

Regarding the first purpose of the study, the results indicate that of the 87 males, 28% were field dependent ($n = 24$) while 21% ($n = 18$) were field independent. The remaining 51% of the males ($n = 45$) were not classified as field independent or field dependent because their scores did not fall into the first or the fourth quartile based on the norms presented for males in the manual for the GEFT (Witkin, Oltman, Raskin, & Karp, 1971). Of the 226 females 46% ($n = 103$) were field dependent while only 19% ($n = 42$) were field independent. The remaining 35% ($n = 81$) were not classified as field independent or field dependent because their scores did not fall into the first or the fourth quartile based on manual norms (Witkin, Oltman, Raskin, & Karp, 1971). The evidence that 65% of the females and 49% of the males were identified to be extremely field independent or field dependent points to the importance of making teachers aware of their less preferred cognitive style and the respective instructional strategies reflective of that style.

Thus, regarding the second purpose of the study, instructional strategies reflective of the field independent/dependent dimension of cognitive style have been identified. Teaching methods are different for the field independent and for the field dependent teacher. These methods differ across teachers' interpersonal

behaviors, instructional behaviors, curriculum related behaviors and behaviors related to testing (Dembo, 1977; Ramirez & Castenada, 1974).

Following is an outline of teaching strategies typically used by field independent and field dependent teachers, respectively (Dembo, 1977; Ramirez & Castenada, 1974).

Instructional Strategies Used by Field Independent Teachers

1. Teachers tend to be more formal in their relationships with their students.
2. Teachers tend to act as an authority figure.
3. Teachers focus attention on the instructional objectives; attending less to the social and interpersonal atmosphere of the classroom.
4. Teachers adopt a consultant role in their instructional strategies.
5. The teacher is more task oriented and less socially oriented.
6. The teacher encourages learning through trial and error.
7. The teacher encourages students to work individually and in competition with one another.
8. The teacher focuses on details, facts and principles in teaching.
9. The teacher emphasizes math and science abstractions using graphs, charts and formulas in teaching across different curricula.

10. The teacher uses inductive learning and the discovery approach to present isolated parts of the lesson, gradually assimilating these parts to construct rules, principles and generalizations.

11. Regarding testing structure and content, the teacher favors a parts-specific, stimulus-centered, analytic structure to the examination.

12. In testing the teacher encourages individual competition by providing encouragement, support, and interpretation of test performance to individuals as opposed to the entire class.

Instructional Strategies Used by Field Dependent Teachers

1. The teacher is reflective of physical and verbal expressions of warmth and approval, utilizing personalized rewards to enhance relationships with students.

2. The teacher encourages cooperation and development of group feelings; encouraging the class to think and work as a unit.

3. The teacher uses informal class discussions to provide opportunities for students to relate new concepts to personal experiences.

4. The teacher provides much guidance in mastering concepts and encourages students to learn through modeling.

5. The teacher relates curriculum materials to the interests and experiences of students as well as to her or his personal interests.

6. Prior to beginning a lesson, the teacher will emphasize global aspects of concepts, identify generalizations and use materials to aid students in the application of concepts for labeling personal experiences.

7. The teacher devises tests in such a manner to emphasize global characteristics of concepts and the deductive approach to problem solving.

8. The teacher constructs test items reflecting more social material, containing personalized material meaningful to the children being assessed.

9. When administering a test, the teacher provides encouragement and rapport and interprets test performance as achievement for the entire group or class as opposed to individual students.

10. Testing is conducted in small groups of six to eight students.

Summary

Cognitive style refers to a person's preferred mode of processing information and the consistency with which perceptions are categorized and organized. Among the numerous dimensions of cognitive style which have been posited is the field independence/dependence dimension. Field independence/dependence is reflected in how people analyze and organize information and their ability to decompose a complex perceptual field into its component parts. In the 1984 fall semester, the Group Embedded Figures Test (GEFT) was administered

to 313 teacher education majors to assess their ability to identify simple figures located in complex figures. The ability to locate the figures indicated field independence while the inability to locate the figures indicated field dependence. The results of this study indicate that 65% of the females and 49% of the males were extremely field independent or field dependent. These results point to the importance of enhancing teachers' awareness of their less preferred cognitive style and the respective instructional strategies reflective of that style. Hence, instructional strategies reflective of the field independent/dependent dimensions of cognitive style were addressed.

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